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PUDENDAL NERVE ENTRAPMENT: EARLY SYMPTOMS, OPERATIVE TECHNIQUES AND RESULTS

ABSTRACT

OBJECTIVE: To investigate pudendal nerve compression, a carpal tunnel-like problem, as a source of pain

STUDY DESIGN: Interviews with twenty-two patients who complained of perineal pain. Pain was relieved by standing and aggravated by sitting and, in some cases, by lying down. Workup and treatments are described.

RESULTS: Certainty of diagnosis varied from absolute to probable of pain from pudendal nerve compression. Pain duration averaged seven years (0.5-20 yrs). Pain severity had caused three patients to consider suicide. History alone from seven (7/22) yielded insights. Physical examination added data from six more (6/22). Treatment with steroid injection (9/22) gave no relief. Surgical release for seven gave major pain relief and restoration of penile blood pressure to (2/7), gave comfortable bladder function to (1/7) whose vaginal pain persisted, gave partial relief to (2/7) and in (2/7) failed.

CONCLUSION: Pudendal neurovascular compression is a sometimes treatable source of perineal pain and dysfunction.

KEY WORDS

pudendal nerve, penile blood pressure, perineal pain, vaginal pain

INTRODUCTION

Pudendal nerve syndrome is almost always overlooked as a source of perineal pain. It was first described by Amarenco, et al in 1987. ¹ This syndrome is slowly being clarified, accepted and treated.^{2,3,4,5-6} It creates pains which are particularly miserable and it generates urinary, anal and sexual dysfunctions.

Twenty-two patients presented with pudendal nerve problems. This article describes some success following early attempts to bring relief. A **few** Case reports will introduce the problem.

Case #1

This case suggested that nerve compression by some moveable structure creates pudendal pain. A 71 year old woman declined an invitation to sit for an office visit. She reported comfort if she stood, therefore she Stood all day. Sitting created burning pain in a "bicycle seat" distribution. Relief appeared immediately on standing. Strikingly, the same pain returned on lying down. This unique history offered clues to a "hammock" which might cause pain as will be described later. Bedtime pain would diminish if she lay perfectly still for 3-4 hours and sleep would follow. The pain had been present for 17 years. It began as she sat watching television.

Physical examination showed tenderness over the pudendal nerve and mild hypesthesia about the anus and perineum. Her symptoms have not changed during 3 years of observation.

Case #2

The findings in Case #2 also suggested nerve compression as a source of pain and demonstrate the difficulties of treatment. A 77 year old professional woman first noted perineal pain 15 years before when spending long hours seated at the computer doing high level scientific work. Pain disappeared with standing and reappeared with sitting or lying down. A toilet seat gave more comfort than a chair and she would sit there for hours to read in comfort.

The pudendal nerve was tender. Electrophysiologic studies were unrevealing, pudendal nerve blocks with local anesthetic gave a few hours of comfort and these blocks confirmed the pain pathway. Steroid injections in Alcock's canal gave no long-term relief. Surgical exploration bilaterally showed fibrosis about the nerve. Release has not brought relief. The patient is now receiving minimal relief from spinal stimulators and intrathecal morphine.

Case #3

This case illustrates that anal function can trigger pain. It offers objective evidence of impairment based on arterial studies. A 31 year old male described pains of the anus and penis that struck during each defecation and lasted for days. Onset was gradual over 4 years. The patient suffered two severe automobile accidents 2 and 3 years before onset in which he received femoral fractures and severe pelvic contusions. Work-up for anal problems was negative and a sphincterotomy had given no relief.

Physical examination showed a tender pudendal nerve. X-rays showed calcification in the sacrotuberous ligament on one side. Electrophysiologic studies were normal.

Arteriograms of the pudendal artery showed slow flow and possible diffuse narrowing with no single point of obstruction. Penile arterial pressures were determined using a cuff and Doppler. The penile arterial index was low at .3. This index is the ratio between penile pressure and brachial pressure. Local anesthetic blocks at the ischial spine and in Alcock's canal gave a few hours of relief confirming the pathway of the pain. Steroids in Alcock's canal gave no long term comfort.

The calcified sacrotuberous ligament was removed and Alcock's canal opened. The patient experienced enough pain relief after decompression of one side that he requested surgery for the second side six months later. Three months of undiminished pain followed each procedure but relief of pain in the anus and penis is nearly complete at 24 months. The penile arterial index has returned to .7 after the first surgery and repeat arteriograms show normal penile flow.

SELECTION OF PATIENTS

All patients selected for this report sought care for perineal pain that suggested pudendal nerve involvement. All twenty-two patients gave interviews, fifteen during examinations and seven by phone alone. This basic information was supplemented by electrophysiologic reports or angiograms from elsewhere. All patient~ had been treated in a variety of non-operative ways and only two had obtained relief.

Seven of twenty-two patients underwent surgical release by the author after extensive work-up and the failure of repeated steroid injections to give pain relief. Two of the patients were operated on twice, one on the same side and one on the opposite side.

The data here recorded are imprecise and the indications for treatment, findings and the classifications are blurred and sometimes contradictory as is to be expected in any emerging concept.

SYMPTOMS

Symptoms for seven patients (7/22) started with long sitting by typists, cyclists and a trucker. Surgery preceded onset in five (5/22) including a vaginal delivery, exploration for post hysterectomy hemorrhage, ureteral reimplantation and two perineal prostatectomies. Trauma (4/22) included splits, a heavy lift, a buttock fall and a remote auto accident. No event seemed responsible for the rest (6/22).

Delay in diagnosis and treatment was the rule. Patients came to my attention an average of 7.3 years after onset (Range 0.5 to 20). Patients consulted urologists, gynecologists, neurologists, surgeons and

internists on multiple occasions and reported little relief from treatments directed toward the anus, the bladder, the prostate and toward perineal muscle spasms.

I record earliest symptoms because delay is considered a source of treatment failure.^{2,4,6} Each patient was re-interviewed regarding onset. First symptoms were perineal pain (9/22), penile, clitoral or vaginal pain or itch (5/22), urinary urgency or burn (3/22), impotence or anal leak (2/22), low abdominal pain (2/22) and unknown (1/22).

Most patients felt hopelessly isolated as the world's only victim of a malady without a name. Patients wondered whether their imagination was the source, but they knew it was not. They report that acquiring a name for their affliction and contacting other sufferers gave important help even while symptoms persisted.

One patient reported onset during long sitting for graduate school study. The first symptom was a tingling in front of the ischial tuberosity on one side. The second symptom she considered more disruptive to her marriage than pain. It was an unpleasant sense of constant sexual stimulation not relieved by intercourse. That was replaced in 6 months by a widespread burning pain involving perineum, anus, labia, vagina and clitoris aggravated by sitting that remains unchecked after more than 13 years despite surgical release and later nerve resection. Current treatment by a pain center is intrathecal hydromorphone (Dilaudid) and a programmable spinal stimulator plus gabapentin (Neurontin). A second woman reported a similar disruptive sexual stimulation.

For one 33 year old male the first symptom was penile pain so severe that he considered asking for an amputation. A deep red penile color was the second symptom. Frequency as often as each half hour appeared at 2 months and erections weakened or failed at 3 months. Bladder neck incisions decreased frequency but within three months pain shifted to the perineum, the anus and the back of the scrotum but not in the testicles. At 4 years the most severe pain is anal, it comes just after the stool falls free, is severe for 30 minutes, moderate for 2 hours more and then settles to the steady perineal pain aggravated by sitting and lying and helped by standing. Similar anal pain radiates to the penis in another male whose first complaint was anal leakage. A male patient of 42 reported first symptoms as decreased erections and ejaculation. Within 6 months he was voiding 25 times a day.

PRESENTING SYMPTOMS

Patients share common symptoms. A videotape is available that recorded several early patients as they described their symptoms of pudendal canal syndrome. Showing it to newly diagnosed patients brings nods of recognition and relief.

Patients came to this series with pain.. Selection plays some part due to my interest in pelvic pain Shafik's interest in disordered function leads to his reports of presenting symptoms of impotence and incontinence of stool and urine.^{7,8,9} Some of his patients also have pain. Pudendal nerve pain is burning, aching, heavy, dull, a constant pain that is sometimes shooting and is always exhausting. Pain affects the entire perineum but may affect just the anus or just the forward structures - penis, clitoris, labia or vagina. The posterior scrotum is more often painful than the testicles. Radiation occasionally occurs to deep lower abdomen, or to the buttocks or even down legs to the feet. Pain may be unilateral or bilateral.

Sitting increases pain. Standing brings instant or delayed relief in most, but prolonged standing grows uncomfortable and increases the severity of pain when the patient does sit. Several noted aggravation with lying down. Walking or physical activity may increase pain as may bowel movements or voiding. Relief is difficult to obtain. Intercourse penetration is painful for women and ejaculation may trigger pain or relieve in men. Quiet lying, often on one side, eventually affords some relief. Hot baths, massage and physical therapy rarely give significant relief. Some patients experienced major weight loss or gain secondary to pain or inactivity.

A MECHANISM OF PAIN

One mechanism may cause pudendal nerve pains in a sub-set of patients.¹⁰ Eight patients reported anal, perineal, vaginal or penile pain on sitting and, strikingly, an identical, intense pain on lying down but standing always abolished or diminished their pain.

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levators only at each end. When the patient stands to find comfort the "hammock" sags . The sag pulls obturator fascia off the nerve. When the patient sits, pain returns because the fascia reclaims the nerve as the sag is pushed cephalad (captured?) by the chair. Pain also returns when the patient lies down because fascia reclaims the nerve as viscera spill off levators and the sag flattens.

URINARY FUNCTION

Some patients report functional changes. Urinary frequency to 25 times per day may be initiated by reflexes or may be only an habitual response to local discomfort. Two patients had to stand in the shower 10 minutes to initiate voiding and two have used self catheterization. One even required a suprapubic catheter for a time to improve comfort and reduce sleep disruption. Incontinence of urine and stool has not been prominent in this series of patients who sought relief of pain.

SIGNS

Physical examination shows nothing on inspection. Palpation may show hypersensitivity of the skin to stroking or pinching. Deeper pressure exposes tenderness throughout the perineum with variable areas showing maximum tenderness. Examination of the anus may generate pain and Shafik reports mucosal changes that I have not yet encountered. Vaginal examination often shows tenderness about the introitus. Pain was always generated by pressing along the course of the pudendal nerve deep within the pelvis on vaginal and rectal examinations. The entire course of both nerves was tender in most patients though one side was often more sensitive. One patient was tender only over the ischial spines.

Muscle twitching was prominent in one patient on finger pressure on one side but only in the anterior levators. Vaginal exam aggravated the twitching and the pain. Decreased perception of pinprick developed inconstantly about the anus, perineum and parts of the genitalia.

NEURODIAGNOSTICS

Electrophysiologic studies of the pudendal nerve are reported in detail from many centers^{2,4,1} and they guide diagnosis and treatment at those centers. In this series they were used infrequently and rarely gave clear information, perhaps due to our inexperience with the tests.

ANGIOGRAPHY

Pudendal artery selective arteriograms were used in three patients.^{10,11} Two patients showed slow flow in the pudendal artery, absent penile flow and possible diffuse narrowing. Improved flow showed on one postoperative angiogram.

Pudendal venograms and cavernosograms brought by one patient showed dilated cavernosal veins on one side with a possible constriction where they left Alcock's canal and a branch vein that was narrowed over much of its course (Bookstein JJ, personal communication, December 1998).

UROLOGIC STUDIES

Patients complain of bladder symptoms. Urine function studies may show some abnormalities but no consistent pattern emerges that is diagnostic of pudendal nerve entrapment. Inconsistencies may
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pain, irritation and spastic states and hypofunction to numbness and paralysis. Different intensities and duration of compression may be responsible.

PENILE ARTERIAL PRESSURE

Penile arterial pressure⁹ was low in two patients in which it was measured. A Doppler probe detects flow distal to a cuft about the base of the penis. Premedication injected into the corpus cavemosum dilates arteries. Results are reported as the ratio of penile pressure to brachial pressure. Preoperative ratios were .15 and .35. After release of ligaments and opening Alcock's canal they rose to 1.0 and .7

STEROID

Dexamethasone acetate was injected about the nerve in all operated patients monthly during preoperative care, once about the ligaments and three times in Alcock's canal under CT guidance. None of the injections gave sustained relief. Shafik does not write of steroid use. Amarenco and Robert now limit steroids to one or two injections out of some unease that repeated injections may increase inflammation and scarring (Amarenco G and Robert R, personal Communications 1 October 1998).

PHYSICAL THERAPY

Fascial stretching by physical therapists and other manipulations is reported to give partial relief. Sporadic trials with patients in this series resulted in mild help. Surgeons see only failures of other methods, a source of surgical hubris to be guarded against.

SURGICAL TECHNIQUE - ROBERT

Professor Robert of Nantes, France, has operated on some 150 for pudendal nerve entrapment. His experience leads him to believe that pain comes mostly from nerves pinched or stretched by the sacrotuberous and sacrospinous ligaments. He considers as important but secondary the fascia of Alcock's canal in its posterior half and the fascia about the inferior rectal nerve as sources of pain.

Professor Robert approaches the pudendal nerve from posterior beside the coccyx⁴ (Bascom j. observer. October 1998). The center of the oblique 10 cm incision lies 4 cm lateral to the coccyx tip. The upper end is 2.5 cm from the midline. Cautery cuts through thick gluteus muscle Obliquely to arrive at tough gluteal fascia and the sacrotuberous ligament just beneath it. Cautery separates muscle from the surface of the ligament. Two curved cerebellar self retaining retractors hold exposure. Scissors, heavy and sharp pointed, divide the ligament and remove 1.5 cm of it. The pudendal nerve lies directly beneath, just medial to the tip of the spine. The surgeon cuts the ligament carefully because the pudendal nerve or a branch sometimes passes through the ligament.

Probes lift the nerve from the sacrospinous ligament. Dissection moves anteriorly, exposing the entrance to Alcock's canal, the edge of which appears as a tight, fibrous semicircle lying medial and superficial between bundle and fat. Scissors divide the fibrous edge to open the canal for 5 mm. The surgeon's finger pushes forward within the canal and toward the pubis for 2 cm to enlarge it further. The fingernail is held against the obturator internus muscle and the finger pad against the nerve for this push.

Further stretching of tissue exposes the interior rectal nerve as it leaves the pudendal nerve, passing and medially and superficially toward the anus. Dissection for 5 mm frees this branch from any binding fascia.

The sacrospinous ligament lies under the nerve. A knife slices the ligament until coccygeus muscle fibers appear. The nerve is gently moved down toward muscle. Bleeders are controlled with bits of oxycellulose sponge, a suction drain evacuates the wound and sutures close the skin.

SURGICAL TECHNIQUE - SHAFIK

In contrast, Professor Shafik directs full attention to Alcock's canal and no longer divides the ligaments because freeing the nerve from the pudendal canal seems to give it sufficient length to lie unstretched. (Shafik A, personal communication, 9/98)

He has approached the pudendal canal three ways, from anterior, posterior and anterior laparoscopically.^{12,13,14} His current approach, the anterior, begins in lithotomy position with a 5 cm incision lying 1 to 2 cm lateral to the anal verge. Small nerve twigs come into view that are branches of the inferior rectal nerve. The twigs are held medial and followed laterally to the pudendal canal. If the inferior rectal nerve is not seen by following twigs then a finger tip finds the nerve during a sweep, moving the finger deeply, medially and posteriorly toward the coccyx.

Dissection follows the inferior rectal nerve to Alcock's canal. Scissors open the surface of the canal backward to the ligaments and forward toward the pubis for 1 cm. Dissection lifts nerve and vessels off the obturator muscle. The surgeon thrusts a finger behind the neurovascular bundle. A sweep of the finger frees the bundle back toward the ligaments and forward toward the inferior pubic ramus. The bundle disappears into and behind transversus perinei muscle about 10 cm anterior to the ischial spine.

The 5 cm skin incision is closed with 2 or 3 sutures tied loosely to allow drainage and the patient leaves the hospital the same day.

SURGICAL TECHNIQUES - THIS SERIES

The lithotomy and prone positions were tried for operations in this series. The latest and most satisfying operation used the prone position and a 12 cm incision placed 2 cm from the midline extending from 5 cm above the coccyx to 4 cm anterior to the anus. The sacrotuberous ligament, exposed by cutting through gluteus, was divided with a transverse cut close to the tuberosity. The ligament **was** a safe guide to deeper and more anterior structures. Division of the ligaments gave no recognized after-effects in this series nor in Robert's patients.

The skin incision near the anus was spread to show the sharp edge between superficial sphincter and fat. Dissection moved deeper beside muscle and parallel to the anal canal. Nerve twigs soon appeared. They were followed lateral and cephalad for a short way toward the pudendal bundle which lay on the side wall of the fossa. Fat bulged between the twigs and the previously exposed ligament, obstructing vision and dissection. Fat was pinched and rubbed apart to identify structures to protect. The result was a satisfying view across the table onto the bundle. Fascia of Alcock's canal lay over the bundle and obturator fascia under the bundle with soft obturator muscle behind the fascia.^{15,16} Dissection lifted the bundle off the sacrospinous ligament and freed it far forward. The wound was closed over suction. This technique offered a low risk path and a comprehensive view to those of us who are still learning the anatomy.

PATHOLOGY

The pathological changes in pudendal nerve entrapment include fibrosis and also compression with flattening or pallor of the nerve.

Pathology is difficult to describe with confidence because asymptomatic nerves are never exposed at surgery. Surgery in this series displayed the canal contents on eight occasions. The most normal appearing Alcock's canal showed a thin transparent roof. When scissors split that membrane then a bundle of soft fatty tissue bulged forward and pulsations appeared that had not been apparent before. The vessels and nerves did not easily separate in the fat and they were not pursued. Several other canals showed an opaque roof so fibrosed to the fatty bundle that it was difficult to define occasionally where one began and the other ended.

Opening Alcock's canal offered a chance to examine the sacrotuberous and sacrospinous ligaments exposed behind the canal. They usually seem separated enough to pass a vascular bundle without constriction. In other cases the gap seemed somewhat narrowed or a tough, fibrous sheath extended back toward the ligaments from Alcock's canal, encircling and probably squeezing the bundle. One

patient had a calcified sacrotuberous ligament on one side that seemed to impinge on the bundle.

One pudendal nerve was resected in an attempt to control intractable pain which had been unrelieved by opening Alcock's canal one year before. The nerve appeared red, thickened and swollen and it adhered to adjacent fat and the underlying ligament. Scissors removed a 2 cm segment anterior to the ischial spine. Pain was reduced Only slightly after resection and anesthesia developed anterior to the anus. However, bowel and bladder function remained intact, a predicted Outcome but a source of concern preoperatively.

If one pudendal nerve remains intact it will support anal and urinary sphincter functions despite loss of the opposite nerve (Romsdahl MM, personal communication, October 1996). This information comes from experience dividing pudendal nerves during resections of sacral tumors. Even patients that lose both pudendal nerves in such resections are continent but must manage bowel and bladder as paraplegics.¹⁷

The rationale for resection grew from experience with pain from damaged ilioinguinal and lateral femoral cutaneous nerves which often show similar thickening. Resection of these nerves is recommended when they are permanently altered by neuroma formation and resection stops pain in 50-70% of cases.^{18,19,20,21} Resection of a pudendal nerve for pain may always fail. Yet, resection may have failed in this case because it was inadequate. I did not resect the nerve back to normal nerve. The resection did not go above the sacrospinus ligament and it probably left the Inferlor rectal branch in place. For these reasons resection should not be discarded from consideration by others on the basis of this one experience alone. Furthermore, from this resection came a specimen that gives us diagnostic tissue in one pudendal nerve case. It showed "... peripheral nerve exhibiting multiple, somewhat disorganized fascicles with perineural fibrosis... Vessels with thickened walls are found . . . in the stroma" . . . The pathologist called this a traumatic neuroma.

RESULTS OF SURGERY

Pain was the indication for surgery in *seven* (7/22). All had experienced temporary relief of pain from pudendal nerve blocks. All failed relief from steroids injected two to four times on the nerve under CT guidance.

Benefits were modest after the 9 operations on 7 patients in this series. Three operations (3/9), one a second side in the same patient) gave marked reduction in pain and restored penile pressures and one (1/9) abolished bladder dysfunction but not the pain. All benefits appeared after 3 to 6 months with some gains up to eighteen months. Three operations (3/9) gave some improvement and (2/9) failed to give net relief. These results are at six to 34 months (Ave 19 mo.).

A problem related to pudendal canal pain is pain from entrapment of a pudendal nerve branch in a prostatectomy scar. One patient was cured prior to my examination at 6 months after prostatectomy, more likely by a steroid injection than by the decoction of St John's wort he began ingesting at the same time. The other patient received complete but temporary comfort from blocks of the scar however, exploration of the scar failed to give long term relief despite removal of one small neuroma.

DISCUSSION

Scientific articles from the United States about surgical treatment of pain from pudendal nerve compression have not yet come to my attention. Most original work has come from France and Egypt. Lay publications describe pudendal nerve problems that affect cyclists and physicians recognize and treat impotence from that source.

"Pudendal" comes from the Latin "pudere" which means to be ashamed. The French named the nerve "honteux" which also means shameful. The name reflects understandable attitudes that add to the reticence of physicians and patients alike to explore an area rife with problems. It is a zone of intense physical, societal and emotional influences that tangle together even in normal individuals Pain and dysfunction increase both the difficulty of care and its importance.

The term 'pudendal canal syndrome' designates a set of findings that are probably related to proctalglia fugax, levator syndrome, postobstetrical incontinence, spastic bladder, coccydynias, urge..... Even the preliminary efforts of this series show that identifying the problem gives some relief to patients.

Surgical release of the pudendal neurovascular bundle was nearly curative for two of seven patients and helped others even at this early stage. Victims will appreciate continued work on the problem.

1. Amarenco G, Lanoe Y, Perrigot M, Goudal H. Un nouveau syndrome canalaire: la compression du neil honteux interne dans le canal d'Alcock ou paralysie perineale du cycliste. *La Presse Medicale* 16: 399, 1987.
2. Amarenco G, Kerdraon J, Bouju P, Bud et C, et al. Traitements des nevralgies perineales par atteinte du neil pudendal. *Rev Neurol* 153:331-334, 1997.
3. Robert R, Labat Jj, LB hur PA, Glemain P, Ct al. Reflexions cliniques, fleurophysiologiques Ct therapeutiques a partir de donnees anatomiques sur le neil pudendal (honteux Inteme) lors de certaines algies perineales. *Chirurgie* 115:515-520, 1989.
4. Rooen: R, Brunet C, Faure A, Lehur PA, et al. La chirurgie du neil pudendal lors de certaines algies perineales: evolution et resultats. *Chirurgie* 119:535-539, 199~1994.
5. Shafik A. Pudendal canal syndrome: Descripuon of a new syndrome and its Treatment Report of Seven Cases. *Colo-Proctol* 13:102-109 1991.
6. Shafik A. Pudendal canal syndrome: A new etiological factor in prostatodynia and its treatment by pudendal canal compression. *Pain Dig* 8:32-36, 1998.
7. Shafik A. Pudendal canal decompression for the treatment of fecal incontinence in complete rectal prolapse. *Ann Surg* 62:339-343, 1997.
8. Shafik A. Pudendal canal decompression in the treatment of urinary stress incontinence. *Int Urogynecol J* 5:215-220, 1994.
9. Shafik A. Pudendal artery syndrome with erecule dysftinction: Treatment by pudendal canal decompression. *Arch of And rol* 34:83-94, 1995.
10. Bascom JU. Pudendal canal syndrome and proctalgia fugax: A mechanism creating pain. *Dis Colon Rect* 3:406, 1998.
11. Snooks SJ, Swash M. Nerve stimulation techniques. A. Pudendal nerve terminal motor latency and spinal stimulation. In: Henry MM, Swash M. *Coloprotology and the Pelvic Floor*, BUTtCTWOrths Ed., 1985, pp112-125.
12. Shafik A. Pudendal canal decompression in the treatment of idiopathic fecal incontinence. *Dig Surg* 9:265-271.
13. Shafik A. The posterior approach in the treatment of pudendal canal syndrome. *Colo-Proctol* 14:310-315, 1992.
14. Shafik A. Endoscopic pudendal canal decompression for the treatment of fecal incontinence due to pudendal canal syndrome. *J Laparoendoscopic & Adv Surg Tech* 7:227-234, 1997.
15. Juenemann K, Lue TF, Schmidt RA, Tanagho EA. Clinical significance of sacral and pudendal nerve anatomy. *J Urol* 139:74-80 1988.
16. Shalik A, El-Sherif M, Youssef A, Olfat E. Surgical anatomy of the pudendal nerve and its clinical implications. *Clin Anat* 8:110-115 1995.
17. Gokaslan ZL, Romsdani MM, Kroll 85, Walsh GL, Ct al. Total sacrectomy and Galveston L-rod reconstruction for malignant neoplasms. *J Neurosurg* 87:781-787, 1997.
18. Kennedy EM, Harms BA, Starling JR Absence of maladactivbe neuronal plasticity after genltofemoral~ilioinguinal neurectomy. *Surg* 118:665-671, 1994.
19. Bascom JU. Pelvic Pain. Perspectives in Col & Rect Surg 11:21-40, 1999.
20. Nahabedian MY, Dellon AL. Outcome of the operative management of nerve injuries in the i~ioinguinal region. *J Am Coll Surg* 184:265-268, 1997.
21. Williams PH, Trzil KP. Managment of meralgia paresthetica. *J Neurosurg* 74:76-80, 1991.